

This listing of claims will replace all prior versions and listings of claims in the application:

**LISTING OF CLAIMS**

-1-(Previously Amended)

1                 A mesostructured crystalline hydrated alumina  
2         composition and consists essentially of boehmite with  
3         atomically ordered crystalline framework walls forming  
4         mesopores, without amorphous hydrated alumina, and  
5         exhibiting at least one low angle x-ray diffraction line  
6         corresponding to a lattice spacing of at least 2.0 nm and  
7         multiple wide angle x-ray diffraction lines with CuK $\alpha$   
8         radiation wherein  $\lambda$  is 0.1541 nm and the boehmite  
9         particularly has characteristic 20/ $^{\circ}$  diffraction lines of  
10         the multiple wide angle lines as shown in Figures 2 and  
11         5 marked "As-made" and 7B marked "MSU-S/B" corresponding  
12         to an ordered lattice comprised of oxygen atoms and  
13         hydroxide groups with aluminum in interstitial positions  
14         within the lattice, wherein the surface area is at least  
15         200 m<sup>2</sup>/g; and wherein the pore volume is at least 0.40  
16         cm<sup>3</sup>/g, wherein the boehmite is formed by mixing a  
17         precursor amorphous hydrated alumina and an organic  
18         modifier which forms the mesostructure and then heating  
19         the mixture so that the boehmite is completely formed and  
20         then removing water and the organic modifier to provide  
21         the composition which can be calcined to form a  
22         transition alumina.

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Claim 2 (Cancelled)

-3- (Previously Amended)

1           A mesostructured crystalline hydrated alumina  
2        composite composition with mesopores containing an  
3        organic modifier in the mesopores of the alumina wherein  
4        the alumina composition consists essentially of boehmite  
5        with atomically ordered crystalline framework walls  
6        forming mesopores, without amorphous hydrated alumina,  
7        and when the organic modifier is removed exhibits at  
8        least one low angle x-ray diffraction line corresponding  
9        to a lattice spacing of at least 2.0 nm and multiple wide  
10      angle x-ray diffraction lines and the boehmite  
11      particularly has characteristic 2θ/° diffraction lines of  
12      the multiple wide angle lines as shown in Figures 2 and  
13      5 marked "As-made" and 7B marked "MSU-S/B" as made  
14      corresponding to an ordered lattice comprised of oxygen  
15      atoms and hydroxide groups with aluminum in interstitial  
16      positions within the lattice, wherein the boehmite is  
17      formed by mixing a precursor amorphous hydrated alumina  
18      and the organic modifier which forms the mesostructure  
19      and then heating the mixture so that the boehmite is  
20      completely formed to provide the composition, wherein  
21      when the organic modifier is removed, the composition can  
22      be calcined to form a transition alumina.

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-4- (Previously Amended)

1                 The composition of Claim 3 wherein the organic  
2                 modifier is a non-ionic surfactant.

-5- (Previously Amended)

1                 The composition of Claim 4 wherein the  
2                 surfactant is selected from the group consisting of a  
3                 polyethylene oxide block co-polymer, an alkylene amine;  
4                 an alkylene polyamine, a polypropylene oxide amine, a  
5                 polypropylene oxide polyamine and mixtures thereof.

-6- (Previously Amended)

1                 The composition of any one of Claims 3, 4 or 5  
2                 wherein the hydrated alumina component is boehmite.

-7- (Previously Amended)

1                   A mesostructured crystalline transition alumina  
2 composition comprising gamma alumina and:  
3                   wherein the composition exhibits at least one  
4 low angle x-ray diffraction line corresponding to a  
5 lattice spacing of at least 2.0 nm and derived from a  
6 boehmite with atomically ordered crystalline framework  
7 walls forming mesopores, without amorphous hydrated  
8 alumina, with multiple wide angle x-ray diffraction lines  
9 with  $\text{CuK}\alpha$  radiation wherein  $\lambda$  is 0.1541 nm and the  
10 boehmite particularly has characteristic  $2\theta/^\circ$  diffraction  
11 lines of the multiple wide angle lines as shown in  
12 Figures 2 and 5 marked "as-made" and 7B marked "MSU-S/B"  
13 as made corresponding to an ordered oxygen atom lattice  
14 with aluminum in interstitial positions within the  
15 lattice, wherein the surface area is at least 200  $\text{m}^2/\text{g}$ ;  
16 and wherein the pore volume is at least 0.40  $\text{cm}^3/\text{g}$ ,  
17 wherein the boehmite is formed by mixing a precursor  
18 amorphous hydrated alumina with an organic modifier which  
19 forms the mesostructure, heating the solution so that the  
20 boehmite is completely formed, then removing water and  
21 the organic modifier from the mesostructured boehmite,  
22 and then calcining the mesostructured boehmite to form  
23 the gamma alumina composition.

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-8- (Previously Amended)

1                 The mesostructured transition alumina of Claim  
2         7 wherein the transition alumina consists essentially of  
3         gamma alumina.

Claims 9 - 26 (Cancelled)